AMBIENT PRESSURE MATRIX-ASSISTED LASER DESORPTION IONIZATION (MALDI) SOURCE AND METHOD OF ANALYSIS

ABSTRACT OF THE DISCLOSURE

A mass spectrometer having a matrix-assisted laser desorption ionization (MALDI) source which operates at ambient pressure is disclosed. The apparatus and method are disclosed to analyze at least one sample which contains at least one analyte using matrix-assisted laser desorption ionization (MALDI), which apparatus comprises:

The present invention relates to an apparatus and a method for ionizing at least one analyte in a sample for delivery to a mass analysis device, comprising:

(a) an ionization enclosure including a passageway configured for delivery of ions to the mass analysis device;

(b) means to maintain said ionization enclosure at an ambient pressure of greater than 100 mTorr;

(c) a holder configured for maintaining a matrix containing said sample in the ionization enclosure at said ambient pressure;

(d) a source of laser energy including means associated with the ionization enclosure for directing the laser energy onto said matrix maintained by the holder at the ambient pressure to desorb and ionize at least a portion of the analyte in the sample, and

(e) means for directing at least a portion of the at least one ionized analyte into the passageway. The ambient pressure (AP-MALDI) source is compatible with various mass analyzers, particularly with mass spectrometers and solves many problems associated with conventional MALDI sources operating under vacuum. Atmospheric pressure MALDI is described. The analysis of organic molecules or fragments thereof, particularly biomolecules, e.g., biopolymers and organisms, is described.